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ABSTRACT

This study identifies and evaluates changes in secondary schools not meeting the minimum standards required by New Jersey as tested on the Minimum Basic Skills Test. The study identified the deficiencies in three urban high schools and evaluated the progress toward meeting the standards. All but 2 of the 76 recommendations made were implemented. The study showed that when the state department of education mandates improvement, schools can and will change. The study recommended the state compute a cost-effectiveness analysis to determine the expenditure per student for changes. The study also found that basic skills should be infused into all course areas. Included is a bibliography and eight tables. (MD)

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THE COST OF STUDENT IMPROVEMENT IN THE BASIC SKILLS

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New Jersey state law requires that all students in public schools must meet minimum levels of proficiency in the basic skills. An administrative code directed that where deficiencies exist as indicated by the Minimum Basic Skills Test, a comprehensive review of the program as the basis of a remedial plan must be initiated. The Comprehensive Basic Skills Review (CBSR) process, developed by the Department of Education, analyzed existing school programs and practices in relationship to those alterable factors which research has identified as associated with successful achievement in the basic skills. This research examined the changes made by the three urban high schools which for three consecutive years did not meet minimal standards, underwent the CBSR process in the Fall of 1980 and achieved the highest gain on the Minimum Basic Skills (MBS) test administered in the Spring of 1981.

The five problems addressed by the research were:

1. What CBSR recommendations were implemented?
2. What costs were associated with the changes implemented?
3. What obstacles were encountered?

4. What was the perception of staff concerning the reasons for improved scores?
5. What other changes were made which were not on the CBSR report or the remedial plan which might have contributed to improved scores?

To determine what Comprehensive Basic Skills Review recommendations were implemented, focused interviews were conducted with district Basic Skills Coordinators and central office administrators and were verified by visiting the buildings, observing the programs and participating with the staff.

Focused interviews also were conducted with district Basic Skills Coordinators and central office administrators to determine the costs associated with the changes implemented. Appropriate line items in the district budget and the Basic Skills Application were analyzed and costs determined for each recommendation which were reported by category and activity by year for each school. A total cost per student for each school was compared to the mean cost per student for all the schools. A summary of the means by category and activity follows. Finally, a cost-effectiveness analysis of each program determined the cost per student for each unit of growth on the MBS test.

For the three remaining problems, data were gathered and answers constructed by informally interviewing, observing and participating with forty-four teachers, supervisors and administrators in a variety of settings

in three buildings.

This research bears out the orientation which is supported in the literature that schools, although resistant, will change if it is imposed upon them by a powerful outside source of authority. The Comprehensive Basic Skills Review team identified deficiencies and made recommendations for change which the schools were required to address with a Remedial Plan within appropriate time lines. The CBSR document was grouped into categories of alterable factors which research has associated with student improvement in the basic skills. Each of the categories was analyzed in terms of the five problems which form the basis of this research.

It was determined that all but two of the seventy-six recommendations made for the three schools were implemented, most of them in the first year. The two recommendations not implemented involved the hiring of additional staff. In each case, however, the schools made changes which may have negated the need for additional staff. It becomes obvious that when the state mandates change within reasonable time lines -- the schools change.

Although change was initiated in the schools by the State Department of Education using a power-coercive strategy, it should be noted that this strategy is frequently linked in the literature to the research and development model. It was through this linkage with the Comprehensive Basic Skills Review process, gounded in

the research associated with successful student achievement in the basic skills, that change was implemented and the resultant student improvement attained.

It was determined that the mean cost per student to implement change over the two year period was $271.88. The most expensive category to implement was Basic Skills Mathematics/Instructional Time which consumed 38% of the total implementation costs, followed by District Policies and Procedures at 24%, Basic Skills Reading/Instructional Time at 23%, Staff Knowledge and Attitude at 14% and Parent/Community Relations at 1%.

Once District Policies and Procedures have been established, enforced and evaluated, funding in that category could be drastically reduced, necessitating only occasional inservice to keep the staff current. Assuming a stability among staff once the faculty has been inserviced on Knowledge and Attitude, funding could also be substantially reduced to a maintenance effort. Both categories represent 38% of the total spent for each student.

Less money was spent in the first year of implementation than in the second year at 43% and 57% respectively. The money spent in the first year was focused on people-intensive activities which could be implemented with existing staff and time already incorporated into the professional contract and redirected to implement the CBSR recommendations. Committee proceedings, staff meetings and inservice sessions were the activities most

often used to bring about change. They also consumed 37% of the cost per student. And this is the critical point. These costs were already budgeted in every school. When asked what had to be given up to implement the activities, the answer invariably was "nothing." The activities redirected the attention of the staff to the task of remediating identified student needs on a school-wide basis. In the second year, the most expensive recommendations were implemented. These included hiring additional staff at 14%, new construction and computer services at 33% and materials, equipment and testing at 8%.

It was determined that all of the recommendations were implemented with existing and reallocated money in the first year and budgeted money during the second year. There was no infusion of new money, no local bond issues or referendums, no special state allocations, no unanticipated federal entitlements. It would appear that the resources for change either already existed in the schools or could be acquired through normal budgetary procedures if sufficient time is provided.

If program effectiveness is based only on cost, high school C had the least expensive reading program per student as well as the least expensive mathematics program per student. See Table 8.

When program effectiveness is based only on student achievement, high school A had the greatest growth per student in a reading program and high school B had the greatest growth per student in a mathematics program.

The assumption that the greater the amount spent per student, the greater the student achievement on the test was not supported by the data. In neither the reading program nor the mathematics program is the most expensive also the most productive in terms of student achievement. Actually, the most expensive reading program is also the least productive and the most expensive mathematics program is separated by less than two points from the least productive as per Table 8.

Cost-effectiveness analysis determines the cost per student for each unit of growth on the test and is calculated by subtracting the mean gain for students in high schools which did not participate in the CBSR process (4.5 Reading, 5.7 Math) from the mean gain of students in the sample schools and dividing the result into the cost per student. See Table 8. Using this specialized method of evaluation, high school C had the most cost-effective reading program and high school B had the most cost-effective mathematics program.

In high school C, students who fell below the minimum level of proficiency in reading were placed in a Basic Skills Reading class taught by a certified reading teacher for one period per day in addition to an English class assignment. Certified reading teachers in this school were organized into a separate department under a Reading Chairperson and given responsibility for student achievement in reading. Class size averaged 13. In addition, every teacher in every class was required

to infuse the basic skills into the subject matter.

In high school B, students who fell below the minimum level of proficiency in mathematics were placed in a Basic Skills Mathematics class for one period per day. Students so placed were not eligible to take more advanced math classes until such time as they could achieve minimum competencies. Student progress was continually and individually monitored by the building principal, a factor identified by the literature as associated with student achievement in the basic skills. Students were retested approximately three times during the year and could be placed in different courses based on the outcome. Each teacher was required to infuse the basic skills in every class regardless of content. Class size averaged 15 students in a basic skills class.

Just as different students will have different needs, so too will different communities have different priorities. In some, achievement will be of paramount consideration for program effectiveness. In others, it will be cost. Still other communities will want to weigh achievement against cost and settle upon a reasonable expectation of each. Such is the value of cost-effectiveness analysis.

It was determined that most of the obstacles mentioned, which were few relative to the recommendations implemented, involved staff-related activities. These obstacles included the difficulties of developing basic skills inservice activities to be implemented by high

school teachers. Some of the committee activities were not meaningful according to staff.

Teachers, supervisors and administrators almost unanimously perceived that the Comprehensive Basic Skills Review either was mostly responsible or somewhat responsible for increased student scores on the Minimum Basic Skills test. One supervisor disagreed. No one in any of the schools disputed the validity of the research on which it was founded or the thoroughness with which it was implemented. Staff viewed it as a helpful, positive experience. Of the people who commented on the group most effected by the publication of the MBS test scores, the majority agreed it was administrators. Since the publicity associated with the publication of MBS scores was mostly negative in the CBSR schools, it can be inferred that administrators were mostly negatively effected by the publication of the scores. To date, one superintendent has been replaced with a person from outside the district and two of the three high school principals are no longer functioning in that capacity.

Other changes were made which were not included on the CBSR or the Remedial Plan which might have contributed to increased scores. A majority of all the people interviewed believed that infusion of basic skills in every course regardless of the subject matter was a major contributing factor to increased test scores. Although infusion was not addressed specifically in the Remedial Plan in any of the three sample schools, it

was treated in detail in the CBSR document and was communicated to the staffs in the buildings. The necessity of instructing students in test-taking skills was emphasized by a large group of staff who considered this the next most important reason for student improvement. The congruence of the curriculum and the test is assumed. This was followed by school-wide incentive programs reported in one school and the constant monitoring of student progress in the basic skills.

The research on successful achievement in the basic skills indicates the importance of a record system based on continuous student progress. This management system, once implemented school-wide, would replace subjective, individual teacher records. Paper work, therefore, would certainly not increase, could possibly decrease and assuredly would be more comprehensive and universal.

Urban secondary schools which are required to make changes may find this study helpful. New Jersey high schools which must make changes to increase the number of students eligible for the state-endorsed diploma could consider this study a paradigm for change. The process identified by the review of the literature may represent a viable model which could be relevant to state administrators contemplating change. By fixing a cost on each of the alterable factors, program administrators should be able to more accurately estimate just how much change one is securing for a given expenditure. Finally, by subjecting each basic skills program to a cost-effective-

ness analysis, administrators will be able to determine the per pupil cost for each unit of growth and thereby be better able to select among programs.

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TABLE 1

The Comprehensive Basic Skills Review document organized 40 alterable factors into six categories as follows and analyzed to determine deficiencies:

I. District Policies and School Management Practices
- District places emphasis on basic skills
- Policy establishes principal as instructional leader
- Good discipline
- Student code of conduct
- Policy of staff development
- Inservice based on specific basic skills program
- Defined decision making process about basic skills

II. Staff Knowledge, Attitude and Expectations
- Teacher knowledge of basic skills
- Teacher have positive attitudes toward program
- Principal provides instructional leadership
- High staff expectations for learners

III. Basic Skills Reading Program
- Teachers use skills array in reading
- Teachers teach what is on the skill array
- Materials are sufficient in reading
- Classroom testing based on skill array
- Consistent classroom record keeping system
- Developmental program is the focus rather than remedial program in reading
- If pull out the negative effects are minimized
- If remediation is in the classroom the classroom teacher is in charge
- Written reading basic skills plan for school
- Individual Educational Plan for low students in reading
- Teacher provides strong leadership in reading

(continued on reverse)

IV. Basic Skills Mathematics Program
- Instruction based on skill array or objective in math
- Teachers teach what is on the skill array in math
- Adequate materials in math
- Classroom testing based on math skill array
- Consistent classroom record keeping system
- Developmental program is the focus rather than remedial program in math
- If pull out the negative effects minimized
- If remediation is in the classroom the classroom teacher is in charge
- Written plan for math basic skills
- Individual Educational Plan for low students in math
- Teachers provide strong leadership in math

V. Instructional Time
- Students have high attendance rate
- Teachers have high attendance rate
- Adequate time devoted to basic skills
- High level of engaged time in class
- Little classroom disruption

VI. Parent/Community Relations
- Parent involvement in basic skills program
- Parent and community support for the school

TABLE 2

THE HIGH SCHOOLS AND THE MBS SCORES BEFORE AND AFTER THE C.B.S.R.

High Schools	Read 1980	Read 1981	% Gain	Math 1980	Math 1981	% Gain
School A	61.12	81.72	20.60	64.63	82.54	17.91
School B	55.58	71.39	15.81	38.68	62.13	23.45
School C	52.71	69.28	16.57	43.25	59.85	16.60

TABLE 3

BUDGET SUMMARY

SCHOOL _____ F.Y. IMPLEMENTED _____ PERSON _____

INDICATOR _____

CHECK IF THERE ARE ATTACHMENTS _____ DATE _____ TIME _____

Accounts	Total Number Positions	Local Resources Equalization Aid	State (SCE)	Title I	Total Appropriation
(2)	(3)	(4)	(5)	(6)	(7)
100 Administration					
Indirect Cost					
212 Salaries Supervisors of Instruction					
213 Salaries Teachers					
214 Salaries Other Instructional Staff					
215 Salaries Secretarial					
216 Other Salaries for Instruction					
220 Textbooks					
230 School Library and Audio/Visual Materials					
240 Teaching Supplies					
250 Other Expenses					
300 Attendance Services					
400 Health Services					
500 Transportation Curriculum Activity					
600 Operation of Plant					
700 Maintenance of Plant					
730 Purchase - Instructional Equipment					
810 Employee Retirement Contributions					
820 Insurance - Judgements and 870 Other Fiscal Charges					
900 Food Services					
1000 Student Body Activities					
1100 Community Service					
1200 Total Capital Outlay					
Total Basic Skills Appropriations					

TABLE 4

HIGH SCHOOL B - Remedial Plan

I. District Policies and Procedures

S1. Monthly chairpersons - administration meet

S2. Weekly department meetings

S3. Quarterly faculty meetings

S4. Meetings - district supervisors and administrators

L1. Employ additional supervisors

S5. Involve principal in basic skills program

L2. Prepare study on vandalism, drop-outs

S6. Develop inservice program

S7. Committee to plan inservice programs

L3. Conduct inservice program

L4. Establish advisory committee

S8. Establish attendance policy

II. Staff Knowledge and Attitudes

L1. Balance teacher assignments

S1. Principal become directly involved in basic skills program

S2. Guidance develops evaluation procedures

III. Basic Skills Reading Program/Instructional Time

S1. Coordination of student needs to basic skills program

S2. Incorporate basic skills into lesson plans

S3. Develop basic skills objectives

S4. Inservice staff

TABLE 5

SCHOOL B

What Costs Were Associated With Each Change Implemented?

Recommendation	Number of Staff	Standardized Hourly Rate	Total Staff Hours	Total Cost	Number Students Dup. or Undup.	Mean Cost Per Student	Reallocated	Budgeted	Funding Source				
									District	SCE	Title I	Other	Year
I. District Policies and Procedures													
S1 Monthly meetings													
Chairpersons (teachers)	5	13.92	7	487.	665	.73		x	x				80-1
Administrators	1	17.39	7	122.	665	.18		x	x				80-1
S2 Weekly department meetings	8	13.92	20	2227.	665	3.35		x		x			80-1
S3 Quarterly faculty meetings													
Teachers	68	13.92	2	1893.	665	2.85		x	x	x	x		80-1
Administrators	3	17.39	2	104.	665	.16		x	x				80-1
S4 Meetings													
Supervisors	2	13.92	5	139.	665	.21		x	x				80-1
Administrators	2	17.39	5	174.	665	.26		x	x				80-1
L1 Employ additional supervisors	2	15.25	1000	30,500.	465	65.59		x		x			81-2
S5 Involve Principal in BSI	1	17.39	168	2,922.	665	4.39		x	x				80-1
L2 Prepare study: vandalism													
Teachers	5	15.25	10	763.	465	1.64		x	x				81-2

TABLE 8

COMPARISONS:

COSTS, ACHIEVEMENT, COST-EFFECTIVENESS

	Comparison of Costs per Student to Implement CBSR Recommendations			
Reading	$115.36	School A	Math	$108.71
	126.22	School B		83.43
	34.59	School C		54.50
	Comparison of Student Achievement Mean Gain 1980-1981 MBS Test			
Reading	20.60	School A	Math	17.91
	15.81	School B		23.45
	16.57	School C		16.60
	Comparison of Cost-Effectiveness			
Reading	$ 7.17	School A		$8.90
	11.16	School B		4.70
	2.87	School C		5.00